Unit 3 - Week 1: Computer Numerical Control Machines: Introduction and Classification

Assignment 1

The due date for submitting this assignment has passed. Due on 2019-09-11, 23:59 IST. As per our records you have not submitted this assignment.

1) In CNC (Computer numerical control) machines, operations are always carried out by

a. Manual operators
b. Cams and templates
c. Form tools
d. None of the others

No, the answer is incorrect.
Score: 0
Accepted Answers: d.
2) On CNC lathes, thread cutting is essentially done by

a. Half nut
b. Programmed instructions
c. Universal dividing head
d. None of the others

No, the answer is incorrect.
Score: 0
Accepted Answers: b.

3) A point-to-point (P-T-P) control CNC machine

a. Always has an interpolator
b. Never has a position down counter for any axis of motion
c. Never has DC motor as prime mover along any axis of motion
d. None of the others

No, the answer is incorrect.
Score: 0
Accepted Answers: d.

4) In a CNC drilling machine, a number of holes have to be drilled on a rectangular metal plate by the execution of a single program. Part surface is parallel to X-Y plane. The holes are on the circumference of a circle with all their axes parallel to Z axis. In order to drill these holes, the following facility has to be present in the CNC drilling machine

a. Rotary table with rotational axis along Z axis
b. Circular interpolation in X-Y plane
c. Linear interpolation in X-Y plane
d. None of the others
Week 4: 3-D Machining, Curved Surface Geometry and Cutter Path generation,

Lecture notes: pdf of all ppts shown

Text Transcription

Solutions

Practice Assignments

5) 1 point

In a table-top CNC set up, there is a stepper motor rotating at 20 rpm and is connected with a table through gear box, lead screw-nut connection as shown in Fig. 1. The table has single axis of motion with basic length unit of 20 microns. The stepper motor rotates and covers one rotation in 200 steps and moves one step per pulse of the pulse generator. In that case, the pulse frequency f, as shown in figure is nearest to (in pulses per minute)

a. 2000
b. 1000
c. 500
d. None of these

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

6) 1 point

[Diagram of CNC setup with labels: Pulse generator, Motor Driver, Stepper Motor, 200 Steps/rev, Gear box, Table (attached to nut), Lead screw]

No, the answer is incorrect.
Score: 0
Accepted Answers:
b.
In a PTP (point to point) closed loop control set-up as shown in Fig. 2, there is an encoder with 200 holes on its periphery. A customer wants to the manufacturer to reduce the BLU (basic length unit) to half its present value. This can be done by

a. Doubling diameter of the encoder but keeping the number of holes same
b. Reducing diameter of encoder to half its value but keeping no. of holes same
c. Reducing no. of holes of encoder to half the original value and increasing the diameter of the encoder to double its value
d. Doubling no. of holes of encoder and reducing diameter of encoder to half its value

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

7) A student is given the assignment to make a CNC drilling machine table with 0.02 mm BLU along each axis and table speed of 20 mm/min along each axis. If he is given a PMDC motor with output rpm of 1440, he should select the following, with connections as shown in Fig. 2

a. Gear box with ratio ¼, lead screw with pitch 4 mm and encoder with number of holes 200
b. Gear box with ratio 1/5, lead screw with pitch 2 mm and encoder with number of holes 100
c. Gear box with ratio 1/5, lead screw with pitch 4 mm and encoder with number of holes 200
d. None of these
8) The most important advantage of CNC machining technology over conventional automatic machining is

a. CNC machining technology is glamorous and brings good profits for its products
b. CNC machining technology is flexible
c. CNC machining technology only uses form tools which are cheaper
d. None of these

No, the answer is incorrect.
Score: 0
Accepted Answers: 

9) In order to cut a circular groove on a 3 axis CNC vertical milling machine, it is necessary

a. To have a universal dividing head mounted on the machine table
b. To have a programmable CNC 4th axis facility (vertical rotational axis)
c. To have a skilled operator to move the cutter manually along the circular path
d. None of these

No, the answer is incorrect.
Score: 0
Accepted Answers: 

10) 

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In a CNC machine with contouring control, the following commands are executed:

N01 G90 G00 X100 Y200 Z 20
N02 G01 X130 Y240 F500

Where F defines feedrate in mm/min. In that case the feed velocity of the cutter w.r.t the work piece in the X direction in line N02 is nearest to (in mm/min)

a. 400  
b. 300  
c. 500  
d. None of these

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  

b.